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Research Note

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RATING THE 1954 FIRE SEASON IN REGION 1 OF THE FOREST SERVICE

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The July-August 1954 fire weather in the western national forests of Region 1 is rated as the easiest since systematic fire-danger rating began in 1934. A statistical system (table 1) provides a guide for describing the weather in each fire season as easy, average, or critical. 1954, with a rating of only 13 percent of worst probable fire danger, was the sixth fire season in 21 years to be classified as easy. There have been 3 critical fire seasons and 12 average fire seasons during the period 1934 through 1954. The last critical fire season occurred in 1940.

The following points characterized the 1954 fire season in relation to fire weather and fire-danger rating:

1. Lowest average July-August fire-danger rating for the entire 21-year period (1934-1954).

2. Lowest average in percent of worst probable fire danger for the entire period.

3. Moderate lightning occurrence in July; above normal in August.

4. Above normal precipitation in both July and August.

5. On only 2 days out of the 62 in July and August was the average fire danger for all western forests above 50.

6. Absence of any critical burning conditions during the fall season.

THE REGULAR SEASON

Percent of Worst Probable Fire Danger

The fire season on the western forests was rated to show the percentage of worst probable fire danger during the 62-day period in July and August. Percentages of 32 percent or less are considered

easy, 68 percent or more considered critical, and 49 is approximately 50 percent of worst probable fire danger. From the analysis, only 3 forests were found to have had average fire dangers of over 30, with a high of 37 on the Bitterroot. The lowest average July-August fire danger was 24, recorded on the Clearwater and Kaniksu Forests.

As an indication of the abnormally low fire danger, the following comparisons are presented in terms of the percent of worst probable. The period beginning with the year 1941 is used, since that year marks the beginning of an apparent cycle of relatively easy seasons:

Average Percent Worst Probable, 1941-1954	34
Highest Average Percent Worst Probable, since 1941	47 (1942)
Lowest Average Percent Worst Probable, 1941-1953	16 (1948)
Average Percent Worst Probable for 1954	13

As a means of comparing the past 3 fire seasons for both eastern and western forests in Region 1, the following tabulation is presented in terms of average percent of worst probable:

	1952	1953	1954
Western forests (10)	40	37	13
Eastern forests (5) (Custer is excluded)	45	51	34

Peak Fire Danger

In contrast to the relatively severe season of 1953, the opposite extreme is indicated in the 1954 season. There was only one peak that even approached serious fire-danger conditions. This peak began building up during the last 10 days of July, reached its highest point on the first day of August and fell off rapidly during the following 3 days. The next 5 days produced rising average fire dangers again, but on August 12 the danger indices began to drop and except for a relatively dry spot here and there, the fire season had ended. It is interesting to note that the periods of high lightning occurrence came when the average fire dangers were quite low--just the reverse of 1953.

Lightning Occurrence

Generally speaking, lightning occurrence during July was moderate. One peak occurred on July 14 to 17 but was not serious in its results because of scattered precipitation and low fire dangers. Lightning was recorded on at least one national forest on 17 of the 31 days in July.

In August, the lightning load was considerably heavier. Peak loads occurred on the 6th, 13th to 20th, 23rd to 26th, and 30th to 31st. However, most of these were "wet" lightning storms, occurring when the fire danger was already much below normal. On the 14th, 15th, and 16th, all 10 national forests reported lightning on at least one of their districts. However, general precipitation throughout the region

virtually eliminated the possibility of a serious outbreak of fires resulting from these storms. The following tabulation gives an indication of the lightning load for the month of August:

5 days - lightning reported on all 10 western forests
4 days - lightning reported on 9 western forests
2 days - lightning reported on 8 western forests
2 days - lightning reported on 7 western forests
1 day - lightning reported on 6 western forests
2 days - lightning reported on 4 western forests
2 days - lightning reported on 3 western forests
3 days - lightning reported on 2 western forests
5 days - lightning reported on 1 western forest

Fire Occurrence in Relation to Fire Danger

The number of man-caused fires in 1954 was 151. This figure is considerably below the 5 year's running average and only 3 previous years--1941, 1948, and 1950--have produced lower occurrence figures since the record began in 1910.

The number of lightning-caused fires was also considerably below the 5-year running average. There were 580 fires started by lightning in 1954. Only 3 years since 1923 (1943, 1948, and 1950) have had a lower lightning-fire occurrence.

It appears that the record-breaking low fire dangerfor 1954 materially affected the occurrence of both man-caused and lightning-caused fires. Scattered precipitation over the Region throughout the summer never allowed the burning conditions to become critical. Although there was a considerable amount of lightning, especially in August, few fires resulted because of the widespread and substantial amounts of precipitation. In contrast to 1952 and 1953, fire danger remained quite low during the hunting season--consequently there was no outbreak of hunter fires.

THE PRE- AND POST-SEASONS

Weather records indicate that pre-season burning conditions were only average or even a bit below. Substantial winter precipitation throughout most of the Region resulted in heavy snow packs and a late spring caused a delayed snowmelt with correspondingly low fire dangers.

Post-season conditions were similar in that the Region received several well-spaced, low-pressure systems that resulted in general light showers and lowered fire dangers. The Region as a whole was probably somewhat deficient in the amount of total precipitation, but light showers at frequent intervals kept fire dangers at a low level--consequently there was no outbreak of hunter fires as there was in 1952 and 1953.

FIRE-DANGER METER

The 1954 fire-season rating is based upon data obtained from the Model 7 burning-index and fire-danger meter. The main features of the new meter are: ability to react to seasonal trends regardless of calendar date, and great sensitivity to factors causing either very low or very high burning index. Experience with the meter has shown that it will rate dry, windy days somewhat higher and calm, moist days somewhat lower than previously used meters. The ratings obtained over an entire fire season appear to be comparable with those obtained from the previously used Model 6 meter.

Table 1.--Percentage of Worst Probable Fire Danger, western forests, Region 1

Statistical analysis of the July-August (62-day average) danger class for each of the 10 western forests (Colville excluded) for the years 1934 through 1950 shows that at least 99 percent of such averages can be expected to fall between a maximum of class 76.02 and a minimum of class 21.48. These limits are therefore assumed as Worst Probable and Least Probable danger classes. By this scale a forest averaging class 76.02 would be rated as 100 percent of Worst Probable. If its average were 21.48 it would rate 0 percent. Class 48.75 rates 50 percent of Worst Probable.

In the cases listed below percentages of 68 percent or more are considered critical and are underlined. Percentages of 32 percent or less are called easy. Intermediate percentages indicate average July-August fire danger.

National forest	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954
	Percentage of Worst Probable																				
Bitterroot	<u>71</u>	<u>71</u>	58	<u>73</u>	52	65	<u>76</u>	36	60	51	34	49	32	36	18	45	36	39	47	49	29
Cabinet	<u>84</u>	61	<u>80</u>	65	65	<u>71</u>	<u>80</u>	46	52	45	34	45	40	36	17	42	29	41	44	44	*
Clearwater	<u>87</u>	65	63	65	52	58	58	34	43	43	23	34	18	23	12	31	24	32	32	29	5
Coeur d'Alene	<u>75</u>	61	65	49	61	<u>71</u>	<u>71</u>	40	43	40	29	38	30	23	10	35	27	38	34	29	10
Colville										52	36	51	36	29	18	49	40	46	49	31	11
Flathead	<u>93</u>	65	<u>78</u>	<u>71</u>	61	67	67	47	43	52	27	40	25	27	16	35	18	27	29	38	9
Kaniksu	<u>71</u>	45	67	52	61	<u>75</u>	67	43	45	45	32	47	30	25	12	36	31	44	42	29	5
Kootenai	<u>78</u>	58	<u>87</u>	61	65	<u>71</u>	<u>71</u>	43	38	45	27	43	29	23	10	24	25	29	35	33	8
Lolo	<u>85</u>	<u>71</u>	<u>85</u>	<u>71</u>	58	<u>71</u>	<u>78</u>	43	55	52	34	52	38	41	30	56	33	38	47	48	23
Nezperce	<u>89</u>	<u>80</u>	67	67	52	58	61	34	49	43	34	43	25	38	12	42	35	39	37	38	19
St. Joe	<u>75</u>	<u>71</u>	61	55	55	67	61	38	45	36	32	36	29	32	16	36	27	39	39	39	11
Average	<u>81</u>	65	<u>71</u>	63	58	67	<u>69</u>	40	47	46	31	43	30	30	16	39	30	37	40	37	13

*Cabinet Forest eliminated. Records included in adjacent forests.